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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • AUG. 23, 1947



Hay Fever Cause

See Page 115

A SCIENCE SERVICE PUBLICATION



The RCA Metal Detector "blows the whistle" on any particle of metal that may have crept into the package.

RCA Electronic Metal Detector—

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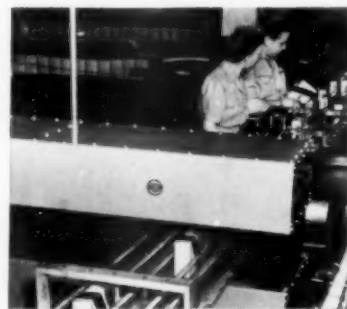
The RCA Metal Detector was developed by RCA product engineers in co-

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So when you buy anything made by RCA—an RCA Victor radio, television receiver, Victrola radio-phonograph, phonograph record or radio tube, you get one of the finest instruments of its kind science has achieved.

When you're in New York, don't miss seeing the radio and electronic wonders at RCA Exhibition Hall, 36 West 49th Street, across from Radio City. Free admission. *Radio Corporation of America, RCA Building, Radio City, New York 20.*

"Victrola" T. M. Reg. U. S. Pat. Off.



The RCA Metal Detector operates through a rejection device, or by stopping the conveyor belt or by giving an alarm. The RCA Metal Detector also saves machinery from damage by "tramp" metal. For details, write to RCA, RCA Bldg., Radio City, New York 20.



RADIO CORPORATION of AMERICA

ASTRONOMY

Daytime Meteor Shower

Radar has discovered a display of meteors, hidden by sunlight. For three months the "shooting stars" have sped to earth.

► A DAYTIME meteor shower that peppered the earth for three months has been discovered by radar.

This new display of "shooting stars" is blinded out by sunlight. It would never have been found by the old-fashioned method of visual observing or even by photography. It could be detected only by the war-developed electronic method of bouncing radio echoes off objects, thus locating them. Meteors are pin-head sized particles that bombard the earth's atmosphere only to vaporize in a flashing instant.

Dr. A. C. B. Lovell, director of the University of Manchester's radar research on meteors, has announced the

discovery in a communication to the British Astronomical Association.

Early in May the meteor shower was picked up as "pips" in the radar signal. The shower continued until early this month when it diminished markedly. Each day there was a peak in the meteor shower at about 11 a. m. The meteors seem to come from about the direction of the sun, which is an astronomical effect due to the varying motions of the sun and earth. Daylight prevents them from being seen visually.

Often the hourly rate of meteors recorded by radar has exceeded 80, and at the daily height of the shower never fell below 20.

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OFFENSIVE WEED—The tall ragweed grows as high as 15 feet, with stiff, reedy stalks.

BOTANY

Hayfever Weeds Bloom

Ragweeds are beginning to spread their poisonous pollen in the North and will soon be blooming in the South. Here is how to curb them:

See Front Cover

► RAGWEEDS have come into bloom, spreading hayfever in northern and central states, and will soon be doing their mischief in the South as well. Yet there is still time to check the shedding of their poisonous pollen with the new weed-killer, 2,4-D, if prompt action is taken.

If you don't suffer from hayfever, you will be doing a kindness to many of your neighbors if you will spray 2,4-D solution on the weeds in your neighborhood, and rouse the community to attack all along the line.

Ragweeds are the worst of our offensive weeds. Their pollen, floating invisibly in the air, makes eyes red and watery, noses puffy and sneezing. The number of persons susceptible to ragweed pollen is probably far less than that of ivy-susceptibles, but whereas you have to go to the poison ivy to be poisoned, the ragweed sends its pollen wherever summer breezes blow, so every hayfeverite is sure to be tormented if

he stays in ragweed territory during pollen-shedding time.

There are several kinds of ragweed, of which two are most abundant and most widely distributed. The common or low ragweed has finely divided leaves on tough, wiry, much-branched stems usually two or three feet high, although eight-foot thickets of it have been reported from Florida. It ranges from the Atlantic coast to almost the base of the Rockies, with its greatest abundance in the Corn Belt.

The tall or giant ragweed has leaves with three large lobes growing on tall, reedy stalks that get to be as much as 15 feet high. Usually they are thickly massed and hardly branched at all, but when a specimen gets enough room for itself it will branch freely and not grow so high.

Foliage of both weeds is coarse and disagreeable to the touch. That of the low ragweed has a taste so bitter and rank that nothing will eat it, not even a goat. Horses and mules will eat the leaves of the tall ragweed; presumably

one of its aliases, horseweed, is in recognition of this.

Flowers of the two plants are much alike, though the flowers of the tall ragweed are much larger. Unlike most familiar flowers, the sexes are borne separately though on the same plants. It is the male or pollen-bearing flower-clusters, borne at the tops of the stalks and branches, that are the trouble-makers, of course. If you are not subject to hayfever, you can get a demonstration of their producing capacity by gently shaking a ragweed. The resulting pollen shower will be astonishing.

Since these flowers have no petals, many people do not recognize them as flowers at all. And because they and the goldenrod are in bloom at the same time, the goldenrod often gets the blame for hayfever. This is an intolerable libel on a beautiful and innocent plant.

Ragweeds begin blooming in the latitude of Minnesota early in August, and the wave of their blossoming rolls southward for about three months. Peak of pollen production in the region of Chicago is about the end of August; it does not come until early October in the neighborhood of Houston, Texas. The season is much shorter in the North than in the South.

2,4-D attack on ragweed can be made at any time. Standard solution is one part 2,4-D to 1,000 parts water. Spraying should be done on still, warm days, to avoid injury to neighboring plants.

It is best to strike it early, of course; but if that has been neglected there is still time even after the pollen-shedding begins. Any given ragweed plant will shed pollen for several weeks, with new flowers coming to maturity all the time. But if the plant gets its dose of 2,4-D it will be crippled if not killed, and the shedding of pollen will stop very soon. Fortunately for us, ragweed is one of the most sensitive of plants to the poisonous action of 2,4-D.

In the Midwest, this should be an especially good time to go after ragweeds, because their thickest stands, especially of the tall species, are on flat river-bottom lands. The floods blotted out millions of acres of ragweed this summer, along with the cornfields, so in many places the spraying crews will

have only the upland ragweed patches to deal with.

In cities, ragweed thrives most rankly on wastelands—the neglected patches between tracks in railroad complexes, on vacant lots, around tumble-down abandoned houses and other buildings. It used to be necessary to send scythe squads to do the sweaty job of mowing them down; now it can all be done with a sprayer.

Of course, there will still be hayfever even if all the ragweed patches in your community are accounted for. The pollen is very light, and the wind carries it for miles from masses still growing in the country. But it is worth while to kill city ragweed patches anyway, for every reduction in pollen density in the air will benefit hayfever sufferers.

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MEDICINE

Weapon Checks Cancer

Chemical, urethane, is being tried against cancer of the prostate gland and has been successful in some cases. It is poisonous drug.

► A NEW CHEMICAL weapon against cancer is being tried at the University of Chicago. This chemical is called both ethyl carbamate and urethane.

It causes "inhibition" (checking) of some cases of cancer of the prostate gland, Drs. Charles Huggins, Sung Ting Yu and Ralph Jones, Jr., report in *Science* (Aug. 15).

Considerable decrease in size of the cancer, relief of pain and an improved sense of well-being occurred in three patients with widespread cancer of the prostate who were treated with this chemical.

The chemical, however, is a relatively poisonous drug. One patient who was given it for 33 days showed improvement at first, but six days after the drug was stopped, he died of necrosis of the liver. Much smaller doses were given to other patients without harm and with some improvement in their condition.

The drug must be given with great caution, the doctors warn, and the number of white blood cells must be checked frequently. When these drop to less than 4,000 per millimeter or when the patient is nauseated, the drug must be stopped.

The chemical is one of a number the Chicago doctors have been investigating for use in cases of cancer of the prostate that have relapsed after being con-

trolled for a time by anti-male hormone treatment.

The anti-male hormone treatment was introduced by Dr. Huggins several years ago. It consists in either surgical removal of the male sex glands or treatment with female sex hormone or both. It is not completely satisfactory because, although the patients at first improve, 80% of them relapse in less than five years.

The favorable effects of urethane are not due to anti-male hormone action or to interference with the cancer cell's nutrition.

The chemical also has a suppressive effect on a transplantable cancer of rats, the Chicago doctors found.

Ethyl carbamate, or urethane, has previously been used as a sedative and, with quinine, in the treatment of varicose veins.

Almost half a century ago the German scientist, Otto Warburg, discovered that small amounts of this chemical would check cell division in fertilized eggs of the sea urchin. Last year a group of English scientists, Drs. E. Haddow and A. Paterson and their associates, reported that it caused a temporary but significant slowing of the growth of mouse breast cancer and a cancer in rats and had a very great palliative effect in human leukemia.

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CHEMISTRY

Old-Fashioned Insect Bane To Give DDT Competition

► DDT, 666 and some of the other new synthetic insecticides may presently have competition from a modernization of an old-fashioned discourager of insects, black pepper. Edward Harvill, chemist on the staff of the Boyce Thompson Institute for Plant Research at Yonkers, N. Y., combines piperine, extracted from pepper with alcohol, with pyrethrin, to make a highly potent insecticide. A one-tenth per cent solution made a 99.8 per cent kill of flies in one test, he states. His patent number is 2,425,530.

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ECONOMICS

England Short of Resources

Britain's crisis is partly due to a shortage of natural resources for manufacturing and little land to raise food. Fuel shortage is possible.

► ENGLAND'S present situation might be likened to that of a manufacturing city without enough raw materials on hand to keep factories going full blast to turn out consumer goods to make the purchase of raw materials possible. Add to this a possible shortage of fuel to power the factories, and little land to raise food.

England is primarily a great factory. It has a poor economic balance between industry and agriculture. It depends on the outside for most of its food. Also it is a very "short" nation in the raw materials that are the essentials in its manufacturing. England lacks domestic metals, textile fibers and wood. Much of its manufacturing depends upon these materials. It has plenty of coal, underground, but very little other fuel.

England's greatest asset in the industrial game is its coal. This makes manufacturing possible, and also transportation by railroad and ocean. Only limited hydroelectric power can be generated, and the amount of petroleum that can be mined is almost negligible. Coal in pre-war days not only met domestic needs but established credits in continental Europe making it possible to get raw materials from the nations buying the coal. England has enough coal for many generations; the present difficulty is getting enough out of the ground. Sufficient coal for export would help the present situation.

But Britain needs more. A manufacturing nation without its own raw materials must have foreign markets for its manufactured articles to establish the necessary credits to enable it to purchase the materials needed. Under normal conditions, England has the facilities and human skills to produce what the world needs, and to receive manufacturing materials in their place. The movement of raw materials and finished products kept railroads and steamships busy, providing occupation for those not in factories, mining or farming.

The British Isles, excluding independent Ireland, are about the size of Oregon and have a population of some 48,000,000. England itself is Alabama's size, and had a prewar population of 39,000,000. Only one-sixth of it was rural. English farmers produced less than one-third

of the food the country required.

England's iron ore supply in comparison with manufacturing needs, is very small. Although textiles are among the country's principal products, it raises no cotton and relatively little wool in comparison with the needs of its woolen and worsted industries. It has but little wood for its wood products output. The principal exports, outside textiles, are machinery, vehicles, electrical and other goods that require metals in making. British spirit may overcome present difficulties, but it will require time.

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HORTICULTURE

New Hybrid Onion Strain Not Very Tearful to Peel

► PEELING ONIONS will not be the tearful job it is now, once a new hybrid onion strain originated by Dr. Glen N. Davis of the University of California comes into more general cultivation.

Dr. Davis has eliminated a large part of the pungent, volatile compound that affects housewives' eyes even more strongly than the sobbiest scenes in "soap-

opry." It is impossible to eliminate all of it, for then there would be no flavor left in the onion, he says.

The new near-tearless onion has a mild sweet flavor, and is especially good for eating raw.

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ENGINEERING

Plated Wire Made to Give Non-Flakable Covering

► ELECTROPLATED wire, made by a new process so that it can be bent, hammered, woven or twisted without flaking, is now in production in the new plant of Kenmore Metals Corporation. It will be appreciated particularly by the radio tube industry and by makers of electric lamps and electrical instruments, but will have many other applications.

In the process, quarter-inch rods are first electroplated continuously with great accuracy. Then they are drawn into fine wire by what is known as the cold-drawing process. This means that they are passed through a series of successive dies or holes in a metal plate, each hole being smaller than the preceding one. The quarter-inch rod can be drawn into wire as fine as 0.0038 of an inch in diameter.

Initial production includes steel wire coated with nickel, and copper wire coated with nickel or silver. The copper-coated wire will have wide usage in radio tubes and lamps and also in many household utensils.

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NUCLEAR SCIENTIST RUNS STEAM SHOVEL—Dr. Lyle Borst, who headed the atomic pile design group at Brookhaven National Laboratory, ceremoniously scoops up the first bit of dirt excavating for the first peacetime atomic pile on the site of wartime Camp Upton. When the pile starts operating next year this spot will be one of the "hottest" on the earth, radioactively speaking.

INDUSTRY

Ruhr Area Vital to Europe

This section is important not only to the industrial recovery of Germany but to western Europe. Conference discusses Ruhr production.

► THE IMPORTANCE of the Ruhr coal conference in Washington, attended by American and British officials, is centered around the question of sufficient production to permit the industrial recovery not only of Germany itself but of much of western Europe.

The Ruhr area in prewar days sent some coal to other countries but, more important, it supplied many nations in Europe with steel and steel products essential in industries. For several years before the war it was producing about 20% of the total world output of steel. One reason that this area achieved so much in steel production is due to its excellent coking coal, for steel production depends upon a supply of good coke. Another reason was that the area is easily reached by ships bringing iron from Sweden, Spain and other places.

In addition to the British and Americans meeting to plan greater output from Ruhr coal mines, the French have a great stake in this crucial area. One importance of the Ruhr coal to France is for a good coking coal for steel production from the great iron ore deposits

in Lorraine, northern France. There is plenty of coal available nearby in the former Saar area of Germany, but it does not make good coke. Ruhr coke could be easily brought to the French iron district by the Rhine and its tributaries and canals.

The Ruhr valley is ideally situated for a great steel-producing business. It stretches eastward from the Rhine up the Ruhr river, which has been made navigable for many miles by dredging and the building of locks. It is this water transportation that permits foreign iron ore to reach the Ruhr furnaces, and permits the shipment outward of the steel manufactured.

Germany, in prewar days, had a second industrial area producing both coal and steel. This was in Upper Silesia, an area that now is within the boundaries of Poland, and is under Russian control. It never was such an important steel manufacturing region as the Ruhr, one reason being that it lacked the good transportation facilities. Its production now will probably go to Soviet-controlled areas.

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ANIMAL HUSBANDRY

Heat Is Bad for Animals

► "WELL, it's good for the corn, anyway!"

This grain of consolation, which Midwesterners like to roll on their tongues during dog-days, loses much of its value in the light of new researches on farm animals' reactions to heat. Hot weather may make corn grow fast, but it makes hogs and steers slow down their meat production, cuts cows' yield of milk and causes hens to lay fewer eggs.

These disconcerting facts were brought out in a talk by J. Robert McCalmont of the U. S. Department of Agriculture. Mr. McCalmont, who is in charge of research on animal housing, spoke as the guest of Watson Davis, director of Science Service, on Adventures in Science over the Columbia Broadcasting System.

The farm animals that produce our meat, milk and eggs, the speaker pointed

out, are unable to keep cool through the evaporation of sweat. They get rid of some of their excess body moisture by rapid breathing or panting; pigs wallow in the mud; cows stand in water. But all these are inefficient cooling systems, and all the animals are likely to slow down their body fires by eating less—which is exactly what we don't want them to do.

Since the climate of the Corn Belt is not likely to change materially, the best thing that can be done for the animals is give them more comfortable quarters—cooler in summer and warmer in winter. Just how much cooler and how much warmer remains to be determined, for up to now the climatic conditions under which farm animals will operate most efficiently have not been thoroughly studied.

That is the program on which Mr. McCalmont is now working. As soon as he has learned, by as exact experimental methods as possible, the temperature and moisture conditions under which cows will give most milk, hens lay most eggs, and hogs and steers produce most marketable meat, he will draw up recommendations for a farm-animal housing program which he estimates will call for an annual outlay of \$1,500,000,000.

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AERONAUTICS

High-Wing Monoplane Made Into Temporary Biplane

► MAKING a high-wing monoplane into a temporary biplane or sesquiplane is the solution offered by J. S. Conner of Los Angeles to the old problem of getting extra lift at takeoff and landing. An auxiliary pair of lower wings, which also carries the landing wheels, folds into recesses in the main wings during flight. The patent number is 2,425,306.

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CHEMISTRY

Waste Bark Has Valuable Plasticizing Material

► A WAXLIKE material known for a century to exist in the bark of pine trees promises to become one of the most important substances in the modern making of plastics.

Prof. H. von Euler of Sweden reported to the International Chemical Congress in London that this bark product, called phlobaphene, is a new and cheap softening agent or plasticizer.

Bark is a waste product in lumbering operations and its utilization is a problem. Manufacture of phlobaphenes from the bark will help solve this difficulty and give the plastics industry a new material. The plasticizers from bark are suitable for replacing plasticizers from castor oil and alkyd products, as well as the phthalic acid derivatives, made from coal.

Up to 30% of synthetic resins produced consists of the plasticizers. Thus the volume of the bark materials needed will be large.

The chemical nature of these phlobaphene bark substances has been determined by Prof. von Euler and they are described chemically as catechol esters of different saturated and non-saturated aliphatic acids, containing 16 to 22 carbon atoms.

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GENERAL SCIENCE

Board To Plan Research

Research and Development Board will be staffed with top-flight scientists and will plan use of money available for research.

► ONE of the boards set up in the new "national military establishment" headed by Secretary of Defense Forrestal will have more to say about the direction of scientific research and development in this country than any other group.

It is the Research and Development Board, heir to the Joint Research and Development Board which has been headed by Dr. Vannevar Bush, wartime director of the Office of Scientific Research and Development.

The Army and Navy have had large amounts of money to grant to colleges, research laboratories and industrial organizations for digging into new problems and developing applications of recent science developments. With the creation of equality between Army, Navy and Air Force, this full-scale and well-implemented research support will continue unabated.

Failure of the National Science Foundation to materialize as expected will throw a continued obligation on those military branches. They have the money and they will use it in the exploration of fields far removed from shot and shell but nevertheless essential to future fighting strength.

The Research and Development Board, with a staff of top-flight scientists largely from the wartime OSRD, has the job of allotting research fields among the various services and seeing to it that no hot leads are overlooked.

Although the unification act provided a chairman of the board, presidentially appointed from civilian life, "with compensation at the rate of \$14,000 a year," this does not mean the replacement of Dr. Bush, who has been heading the joint board on a part-time basis, just as he ran the OSRD and remained president of the Carnegie Institution of Washington as well. The way seems to be open for Dr. Bush to continue as chairman, thanks to "at the rate of" wording of the act, and he will probably do so.

It is not too much to say that the chairman of this board will be the most powerful person in the nation in the allotment of scientific research funds. He will be the only member of the board

of seven who is not a representative of Army, Navy or Air Force. He will decide differences between the three services.

Of major importance are the two other boards that are created under the unification act. These are the National Security Resources Board and the Munitions Board. The Resources Board's closest approach in the past was the War Reconversion Board, headed by James Byrnes before he became Secretary of State. It is policy-making in industrial and civilian mobilization, in use of natural and industrial resources, in strategic and critical materials, in strategic relocation of all the nation's activities.

The Munitions Board is concerned more directly with procurement, production and distribution among the armed services, but it will be concerned also with the important matter of the adequate reserves of strategic and critical materials.

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ENTOMOLOGY

Two New Chemical Weapons Used in Mosquito Warfare

► MOSQUITOES have two new chemical-warfare weapons to face, that are expected to make life more miserable—and shorter—for them in future summers. Both weapons have been demonstrated by Dr. Elton J. Hansens.

The first is a pint-size, one-man version of the big insecticide fog-machines

that have come into use for large-scale attack during the past year or two. It is known as a mosquito fumer. It consists of a can containing a nicotine product, plus fuel to convert this into a thermofog. To operate, a lighter somewhat like a Fourth of July sparkler is first ignited, then pushed through a diaphragm on one end of the can. The fumes continue to be effective against mosquitoes for two or three hours.

The second device demonstrated by Dr. Hansens is called a pinstream oiler, and is intended for use against mosquito larvae or "wigglers" in marshes and ponds. Hitherto, fuel oil has had to be applied to such places, at a rate of about 25 gallons per acre, and since this work has to be done mainly on foot this is a rather terrific burden. Now, one gallon of a concentrate containing 1.5% DDT and 0.5% of a spreader will treat the same area that used to require 25 gallons of oil.

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HORTICULTURE

New Jersey Orchid Crop Gets Special Attention

► ORCHIDS, as well as peaches and tomatoes, pig rations and silo stuffing, are getting scientific attention at the New Jersey State Experiment Station. There's a reason: New Jersey is the home of the greenhouses where fully half the commercially-grown orchids in the United States are produced. The crop is worth three million dollars a year.

Under the direction of Dr. O. W. Davidson of the Station staff, studies are being made on the effects of growth hormones on orchid bulbs, stems and flowers, also on the light and humidity requirements of the temperamental plants, and the acid-alkali balance on which they thrive best.

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FIVE-PLACE HELICOPTER—The Army XR-12, with a top speed of 105 miles an hour, is undergoing preliminary tests. A two-bladed rotor system is used with a gyroscopic action stabilizer bar.

ARCHAEOLOGY

Pottery-Makers Used Coal Centuries Ago in Arizona

► DIGGINGS in the pueblos of Hopi Indians in Arizona indicate that coal was used in this country in the 13th century in burning pottery, the U. S. Bureau of Mines revealed.

The archaeological investigations have produced proof of this in unearthing old coal workings in which the primitive tools used for mining were found.

Virginia is recognized as the first state within the present limits of the United States in which coal was mined commercially. This was in 1750 in the Richmond coal basin, where coal was found about 1700. Coal was found by white men in Arizona in 1881, but production even in these latter years in that state has been only about 10,000 tons annually.

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MEDICINE

Synthetic Vitamin K Aids X-Rays in Cancer Fighting

► A SYNTHETIC substitute for vitamin K, the anti-bleeding vitamin, is being tried as a weapon against cancer.

No curative value is claimed by the Cambridge University scientists, Prof. J. S. Mitchell and Mrs. I. Simon-Reuss, in their report to the journal, *Nature*.

But, they report, the vitamin K substitute checked the division of cancer cells. The division process, known as mitosis, is that by which more cancer cells are produced and the cancer grows.

When X-ray treatments were given after the vitamin had been injected into the muscles daily for several weeks, the effect on cancer cell division was even more pronounced. Bits of tissue from a cancer on the floor of the mouth were examined under the microscope. After the synthetic vitamin K substitute treatment there was a "highly significant reduction" in the frequency of cancer cell division. This would indicate that the cancer's growth was being checked.

X-ray treatments were then given and after that it was impossible to count the dividing cells in a bit of the cancer tissue because all the cancer cells were grossly degenerate. Similar checking of cell division was observed in chick embryos.

The synthetic vitamin substitute had no toxic or ill effect on the 25 patients to whom it was given, showing that it

would be safe to use if it proves effective.

The anti-bleeding action of vitamin K was first discovered in relation to chickens. It has since been used to save newborn babies and sick grown-ups who were in danger of bleeding to death in certain kinds of jaundice and liver disease.

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NAVIGATION

Collars Make Buoys Easy to See at Night

► REFLECTING COLLARS, that fit around harbor, bay and river buoys to mark shipping channels, make the anchored warning floats more easily seen at night when searchlight beams fall on them.

The principle employed is similar to that used in roadside reflectors to warn automobile drivers. Their installation has been revealed by the U. S. Coast Guard which already has several thousand in place on New England waters and in the Mississippi river area.

The reflecting material is sheet metal and is either red or black, depending upon the color of the buoy. In the surface of the metal band are many small crystals that cause the reflection. These buoys are visible at all angles because the minute crystals reflect light beams striking them from any direction.

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CHEMISTRY

Improved Method Extracts Thorium from Minerals

► ONE of the most widely known of British chemists, Dr. Frederick Soddy, retired Oxford University professor, has received U. S. patent 2,425,573 on an improved method for extracting thorium from minerals containing it.

Thorium is another element with an unfamiliar-looking name; actually, however, it was a household article not so long ago. Its oxide was the stuff gas mantles were made of. It is still used in ceramics and other industries, and is a definite possibility in the development of atomic energy.

Basically, Dr. Soddy's method consists of using less sulfuric acid than customary in getting the thorium out of the phosphatic minerals, and in exploiting the phosphoric acid thus released in the separation of cerium and other rare-earth elements from the thorium.

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IN SCIENCE

NUTRITION

Dried Celery Tops Found To Make Good Chicken Feed

► CELERY TOPS and trimmings make good chicken feed when dried. Research at the Florida State Agricultural Experiment Station has shown that dehydrated celery tops compare quite well with alfalfa meal as a chicken feed, and the tops are now being commercially dehydrated at Sarasota and Tampa.

Heretofore, approximately 75,000 tons of celery trimmings have been hauled from Florida packing houses to fields each year and used as fertilizer.

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PARASITOLOGY

Rubber Tree Termite Pest Attacked by New Fungus

► TROPICAL termites are not satisfied with a diet of houses, furniture, books and other valuable things made of wood and its products; some species infest living trees. One species, in particular, has become a pest of the plantation rubber tree, *Hevea brasiliensis*.

Now it appears that this pest becomes victim to a pest of its own, a fungus that parasitizes and kills it. This discovery has been reported to the editor of *Nature* (July 26) by R. A. Altson, a scientist on the staff of the Rubber Research Institute of Malaya, at Kuala Lumpur.

Mr. Altson had numbers of the pest termites caged in his laboratory for study. He found that they were dying off faster than they normally should. Postmortem examinations disclosed a fungus in their bodies.

It proved easy to propagate this fungus on rice-bran. Healthy captive termites fed on rice-bran thus infected died to the last insect within 48 hours. Similar numbers of uninfected termites had a mortality of only three per cent. The evidence seems conclusive.

It was already known that a Cuban termite genus is similarly infected by a fungus known botanically as *Conidiobolus*. The Malayan fungus appears to be similar to this, though not identical with it. For this reason Mr. Altson regards his discovery tentatively as a new species.

Science News Letter, August 23, 1947

NE FIELDS

CHEMISTRY

New Glycol Type Alcohol Has Unusual Properties

► **USEFUL** as a dirt remover, a new glycol alcohol has a combination of properties not found in other such chemicals. It is expected to have wide usage in soaps and what are known as cleaning detergents, and also in oils, greases, and lubricating preparations.

One type of glycol is well-known. It is used in anti-freeze mixtures in automobile radiators. This is ethylene glycol. The new type, developed by Celanese Chemical Corporation, is methylpentanediol. It has a higher boiling point, 215 degrees Centigrade. It has unusual solubility for a wide range of resins, and mixes well with common solvents. It has limited solubility in water.

Glycols are alcohols somewhat similar to the common ethyl alcohol, and also somewhat similar to glycerine. The best known of them, the ethylene glycol, is a colorless liquid with a boiling point of 197.5 degrees Centigrade and, in solution, freezes at a temperature several degrees lower than the freezing point of water. The unmixed ethylene glycol freezes at about minus 16 degrees Centigrade.

Science News Letter, August 23, 1947

NUTRITION

World Food Outlook Grim With Increased Shipments

► **MOST** of the hungry people of the earth are going to have to keep their belts pulled tight for another year, despite a large step-up of grain imports into deficit areas, according to the Food and Agriculture Organization of UN.

Shipments of the crop year 1947-48 will amount to between 30 and 34 million tons of grain, as against 28 million for 1946-47. But the minimum need is for from 34 to 38 million tons. Even with increased quantities of potatoes, sugar and fats, FAO comments, "the situation will continue to be grim."

There is still time, the report continues, to help our hungry neighbors to help themselves with a better 1948 harvest in their own lands. This can be done by increasing shipments of farm

machinery, fertilizers and pesticides during the next six months.

For long-term improvement in world dietary conditions, FAO sees a necessity for modernizing agriculture in Asia, together with building up other industries at which the crowded populations of that continent may earn a living off the land. With this should go the opening of lands on the world's last great frontiers, Africa and Latin-America.

At the forthcoming Geneva conference, to open Aug. 25, representatives of the 60 constituent members will be asked to decide upon a proposal to set up a council for the carrying out of a five-point program intended both to meet present emergency food situations and to work towards a stabilized increase in the world's nutritional condition.

Science News Letter, August 23, 1947

DENTISTRY

Diet To Banish Pain After Tooth Is Pulled

► **A HIGH** alkaline diet will prevent pain after a tooth has been pulled, Dr. Leonard S. Morvay of Newark, N. J., advised at the American Dental Association meeting in Boston.

For 24 hours before and 48 hours after tooth pulling, he tells his patients to eat a diet including plenty of citrus fruits and juices, leafy green vegetables and tomatoes, and at least one quart of milk daily.

Such a diet gives the blood a heavy alkalizing, he said, and this makes for ideal healing conditions in bony tissue.

Acid-producing foods should be avoided. These include meat, fish, fowl, fats, cheese, grain, sweets, cranberries, rhubarb, alcohol, coffee, tea and chocolate.

Excessive exercise should also be avoided, Dr. Morvay advised, because it creates lactic acid and lessens the body's alkali reserve.

Patients having teeth pulled should always, in his opinion, drink large quantities of water following the operation.

A high acid content of the blood is usually present in cases of "dry socket," he said. This is a condition in which a satisfactory blood clot has not formed after the teeth are pulled. In many such cases, pain persists even after the patient is given morphine or other sedatives. Bone tissue, he said, does not regenerate quickly when the acid content of the blood is high.

Science News Letter, August 23, 1947

BIOCHEMISTRY

Wild Mushrooms Contain Penicillin-Like Compounds

► **ANTIBIOTICS**, or penicillin-like compounds, are not only in soil molds but in their evolutionally higher relatives, the fleshy fungi or mushrooms. A survey by Dr. William J. Robbins and a group of co-workers at Columbia University and the New York Botanical Garden disclosed germ-stopping powers in 213 out of 332 species of mushrooms examined.

Now Dr. Robbins, with Dr. Frederick Kavanagh and Miss Annette Hervey, have made a more intensive study of two species of wild mushrooms cultivated in the laboratory, and have been able to isolate the antibiotic substances in them. From one species, *Pleurotus griseus*, they have obtained a substance which they have named pleurotin, and they suspect that the mushroom contains a second antibiotic, not yet isolated. Pleurotin is able to check growth of the boil germ, *Staphylococcus*, as well as the tuberculosis germ in laboratory vessels. Beyond determining that it is non-toxic to white mice in moderately heavy doses its possible medicinal value has not yet been explored.

The second mushroom species, *Polyporus biformis*, yielded two germ-stopping compounds which have been named biformin and biforminic acid. Biformin proved effective against the two test organisms, the germs of boils and of tuberculosis, in glass vessels. Addition of rabbit blood greatly reduced its activity, so that it was not surprising to find that it had no effects against the same two germ species in the bodies of mice.

Details of the research are given in two reports published in the official journal of the National Academy of Sciences (June).

Science News Letter, August 23, 1947

CHEMISTRY

DDT Relative Recommended Because It Is Not So Toxic

► **METHOXYCHLOR**, close chemical relative of DDT but claimed to be only one-fortieth as poisonous to man and warm-blooded animals, was recommended for that reason as a protector of fruits and vegetables to the meeting of the International Apple Association by Dr. W. H. Tisdale, du Pont research chemist.

Spelled out in full, methoxychlor is bis-(methoxyphenyl)-trichloro-ethane.

Science News Letter, August 23, 1947

CHEMISTRY

Dyes from Your Garden Plants

Onions, beets and flowers yield rich, warm colors. Many of these will not dye the same as the colors of the flowers. Mordants make variety of shades.

By MARTHA G. MORROW

► THE GREEN stain of grass across your shirt or the red juice of berries on your dress may spell trouble to you because it is hard to remove—but to your ancient ancestor it may have suggested a new source of color.

Many ancient dyes were discovered entirely by accident. The earliest dyes were probably stains from berries, fruits and nuts. Early man liked the color of the stain, discovered it lasted despite the sun and rain, and began to use it to dye his fabrics.

Later, flowers, leaves, stems and roots of shrubs, bark and twigs of trees were found to be good sources of dye. Primitive people of almost every country seem to have developed their own favorite dyes.

Vegetable Dyes First Used

At first, dyestuffs of vegetable origin, available in the neighborhood, were the only ones used. The primitive dyer merely collected flowers, berries, leaves, bark and roots in nearby fields or forests, and boiled them in water to extract the dye. Colors were limited pretty much to red, yellow, green, blue and brown. Few variations in shades and tones were possible.

In time, however, some dyes proved more satisfactory than others. Sometimes this was because the colors were more pleasing, sometimes because they lasted

longer. As dyestuffs found in one district were recognized to be superior to those of another, dyestuffs were imported from neighboring regions and trade in them began. Eventually many of the dyestuffs used in ancient times were eliminated as unsatisfactory, so that only a few survived the test of time.

Natural dyes are seldom used today. Chemical dyes, discovered in recent years, have proved so popular that there is little demand for the old-time favorites such as indigo (blue), madder (red), woad (blue), logwood (purple) and fustic (yellow). But many people interested in weaving and embroidery insist that the materials be dyed with natural dyes, valuing the colors for their richness and warmth.

The gay goldenrod blooming in the field or along the roadside is an excellent source of dye. The fresh, bright flowers give a lovely yellow-orange. But dye can also be secured from the faded flowers that have passed their prime or from the dried-up petals that remain on the stalk long after frost. The color, though perhaps not so brilliant as that secured from the fresh flowers, is pleasing and lasts well.

A burnt-orange dye can be secured from the dry brown outer skins of onions. Tea leaves produce a lovely rose-tan. Twigs pruned from apple trees may be used to dye cloth a golden yellow.

Some dyes give their color directly to the wool without any preliminary prep-

aration. For others, the fiber must be specially prepared before it can take the color. Because the auxiliary chemicals make the dye "bite" better into the material, they are called "mordants." This comes from the French word *mordre*, meaning to bite.

Alum found in local mineral deposits was used by the Egyptians, Chinese, Greeks and Indians of both America and Asia as a mordant. Today potash alum is considered an excellent mordant. Cream of tartar is frequently used with it to brighten the color. Another popular mordant is potassium dichromate.

Variety of Shades

A given dyestuff can be made to produce a variety of shades or even different colors by using different mordants. Dahlia flowers used with a chrome mordant, for example, on wool produce an orange color. But a light yellow is obtained with alum.

To obtain the desired color or shade, it is often necessary to dye one color over another. Green is produced by dyeing the cloth blue with indigo, then dipping the wool in a dye obtained from goldenrod flowers. To get a light terra cotta, some experts obtain a brass shade from broomsedge, then top-dye the cloth with madder.

Good black dyes are difficult to obtain. Black can be produced, however, by dipping a piece of wool mordanted with alum in the indigo vat, then dyeing it in the brown obtained from walnut hulls. If iron salts are used, black dyes can be made from oak galls, sumac leaves or other plants containing tannic acid.

Pastel shades are the ones most frequently produced with vegetable dyes. Yellow and brown are most likely to be obtained by an amateur experimenting with easily available plants. The better vegetable dyes last well and are improved by the mellowing touch of time.

The amount and intensity of a dye obtained from a plant often vary with the age of the plant. The younger ones usually give a weak dye. A plant with a great deal of water in it usually gives a dilute color. Plants collected in the fall do not necessarily produce the same shade as those collected from exactly the same locality in the spring. It is difficult to duplicate the exact shade of a vegetable dye.

The color of a flower is no guide to



DYESTUFFS—Berries, roots and leaves found everywhere can be used in dyeing.

the shade of dye it will produce. Brightly colored autumn leaves are not a source of dye. Berries are often disappointing.

A dye that is fast on one fiber may not be so satisfactory on another. Or it may be fast when dyed by one method and not at all fast when applied by another. Of all the textile fibers, wool is the best. It can be dyed easily and the resulting colors change the least. It combines with practically all dyes.

For those who want to discover for themselves which plants are a good source of dye, here is a standard recipe that can be tried on almost any plant part, be it blossom, leaf, root or bark. For each pound of cloth, use a peck of fresh dye-plant. Crush or tear into small pieces, then cover with water and soak overnight. Boil the plant for about an hour, then strain off the colored broth. To this dye extract add enough water to make four gallons for the dye bath, place the wool in the liquid and simmer for 30 minutes. Rinse the cloth and let dry.

Those who prefer to dye just a small piece of cloth each time until the exact shade desired for a scarf or pocketbook has been produced can use only a handful of flowers, leaves or roots each time. Just be sure to cover the dye-plant well with water when you let it soak overnight and replace the water as it boils away.

Mordant Required

A large number of natural dyes require a mordant. Madder, for instance, produces no color on the wool unless alum, chrome or some other mordant is used. The lovely gold dye of privet leaves is entirely lost if a mordant is not employed.

One of the simplest mordanting recipes calls for four ounces of potash alum, one ounce of cream of tartar and four gallons of water to each pound of wool. After the alum and cream of tartar are dissolved, the wool is immersed in the solution and heated gradually to a boil. After boiling for an hour, it is allowed to cool and the wool remains in the mordant overnight. Then the liquid is squeezed out, the wool rolled in a dry towel and placed in a cool place until ready for use.

The fastness or permanence of a dye is important, but no dye is absolutely fast under all conditions. It may be fast to light, or to perspiration or to washing, but not fast to all three. A number of simple tests, similar in principle to those



DYE BATH—It is only necessary to boil the raw materials in water to bring out the color. But you may get an entirely different color from what you expect.

used in testing cloth professionally, can be applied in the home.

A series of cut-outs will show whether a color will fade in the sun. Cut openings an inch square in two pieces of heavy cardboard. With gummed paper fasten the dyed cloth to one of the pieces so that the cloth shows through the cut-out. Cover the cloth with the other piece of cardboard, being careful to have the openings correspond so the light comes through the fabric. Put the frame in the direct sunlight and tilt toward the sun. After a dozen sunny days, comparing the area exposed to the sun with the protected portion will show if the dye is sun-fast.

A two-inch square of dyed wool sewed to a similar piece of undyed wool will help show how water affects the dye. If this is placed in a fruit jar partly filled with soapy water and shaken thoroughly for about a half hour, you can pretty well tell how it will withstand washing. After the water has been squeezed out and the sample rinsed a number of times and ironed dry, unsatisfactory colors will have faded or "bled" onto the undyed piece.

The late summer or autumn garden offers a wide variety of natural dye sources. A large number of experiments has been worked up for the benefit of those interested in obtaining dyes from what is available in and around the home. These, plus three of the ancient vegetable dyes and a mordant are contained in a kit specially prepared for you by Science Service. Just send 50c to Science Service, 1719 N St., N. W., Washington 6, D. C., and ask for the Vegetable Dye Kit.

Science News Letter, August 23, 1947

VETERINARY MEDICINE

Sulfur Found To Prevent "Over-Eating Disease"

➤ A TIME-TESTED remedy from grandma's medicine chest has become the newest way of preventing the most serious disease of lambs in the West.

Confronted with the problem of cutting down feeder lamb losses due to the "over-eating disease", technically known as enterotoxemia, four Colorado veterinary scientists decided to experiment with ordinary ground sulfur mixed with the lamb's feed.

Results of this treatment over an extended test period are reported in the *Journal of the American Veterinary Medical Association* (Aug.). They indicate that it was of distinct value in keeping down "over-eating" losses on feedlots. While mortality ranged as high as 8.2% in untreated control lambs, losses of treated animals did not exceed 1%.

The researchers, J. F. Christensen, A. W. Deem, A. L. Esplin, and F. Cross, all of the Colorado Agricultural Experiment Station, said there was some reduction in grain consumption and daily weight gains of lambs fed relatively large doses of sulfur, but no toxic effects were observed. They believe that by reducing the amount of sulfur fed in continuing experiments, the unfavorable effects upon weight gains and grain consumption may be eliminated without sacrificing the benefit of the experiment.

Science News Letter, August 23, 1947

So popular has the insecticide DDT become that it is now being produced at a rate of over 3,000,000 pounds a month.

Do You Know?

Almond hulls are a fairly good source of *tannin* for leather making.

Crude *petroleums* from no two fields in the world are exactly alike.

Infants need three to four times as much food *protein* per pound of body weight as adults, it is claimed.

Eggs are likely to absorb odors, so should be stored away from strong-smelling foods.

"*Pickling*" as used in the steel industry consists of giving the semi-finished steel a bath in sulfuric acid to remove tiny surface scales.

Corn is still America's most important agricultural crop; the amount raised has a value equal to the total of the principal small-grain crops.

If the bottoms of utensils used in *picnic cooking* over open fires are rubbed with soap before using, the soot is removed easily.

Aluminum *paint* is satisfactory on radiators in the home because the heat of the radiator will not cause it to chip as it does to certain other paints.

Storms that cause static near a radio transmitting station do not affect distant receiving sets; the static does not ride in on the same wave that brings the program.

Although the *sun* is some 3,000,000 miles farther away from the earth in July than it is in January, the weather is hotter in the northern hemisphere because the sun is more nearly overhead.

Sugar beet seed for American crops, prior to and during World War I, was obtained from abroad; the seed is now raised in this country, and quantities were exported to the Allies during World War II.

Economic life in the far-flung Pacific *Marshall Islands*, which America will now supervise, is based largely on coconut, breadfruit, pandanus and fishing; as a result of the war, the natives now want American canned foods to give variety to their diet.

PHYSICS

X-Rays Disguise Jewels

New tube gives stones colors that make them look more valuable. Sunlight brings back the original color, giving a way to detect fraud.

► JEWEL THIEVES and dishonest gem dealers may turn a new scientific development into a new way to cheat the public.

The scientific development is a new X-ray tube. It can be used to give gem stones a more valuable color. The buyer of diamonds treated with X-rays from the new tube might find the stones turning yellow. Some other gems given the X-ray treatment would fade in color or revert to a cheaper hue.

Developed by Machlett Laboratories, Springfield, Conn., the new X-ray tube has a beryllium window. This permits longer wavelength rays to get through than more conventional tube windows.

When gems are exposed to the rays, some of them take on new colors. Cheaper, yellowish diamonds look like more valuable stones.

Color Lasts in Dark

The color changes seem to last indefinitely in the dark at room temperature. But heat or sunlight will bring the gems back to their normal color.

Dishonest gem dealers could keep X-rayed stones out of the light until selling them. Only after the buyer had exposed the gems to sunlight or heat would the fraud become evident.

Reporting on X-ray treatment of gems with the new tube, Dr. Frederick H. Pough of the American Museum of Natural History in New York and T. H. Rogers of Machlett Laboratories warn against commercial hoaxes.

They suggest a fading treatment, exposing the gems to sunlight or heat, as the best way to detect X-ray jewel swindles.

The effect of X-rays or radium on gems has been known for some time, but the new tube makes the treatment quicker and more effective. Curiously enough, X-rays also are used by gem dealers to prevent one common type of fraud. X-rays can be used to show up fake diamonds and other imitation gems.

Writing in the American Mineralogist, Dr. Pough and Mr. Rogers report on a number of different stones treated with X-rays. Here are some of the color

changes in common gems which can be produced with X-rays:

White or pinkish sapphires become a brilliant amber color.

White topaz turns to brown-purple.

Pinked topaz changes to orange-brown.

Aquamarine beryl, normally pale blue, is made light green.

Dark green tourmaline takes on a dark rose-purple color.

Lilac kunzite is turned to green.

Not all gems changed color under X-rays in the experiments. Emerald beryl is still green after an hour's treatment, while opals show no color change after several hours of X-rays. Time required to alter the color of the stones which did change hues varied with the different kinds of gems.

The way X-rays change the color of gem stones is believed to be by knocking off negatively charged particles called electrons from the atoms or ions making up the crystal structure of the stone. All crystals are made up of rows of atoms or ions regularly spaced, but there may be some nooks or crannies in this construction.

When X-rays strike the gem, they may free electrons. The loose particles may slip into these crannies and give the stone a new color.

Heat and sunlight are believed to release the electrons again and send them back into their normal positions, bringing back the original color to the stone.

Science News Letter, August 23, 1947

AERONAUTICS

Flying Freight-Car

► ANOTHER flying freight-car is the subject of patent 2,425,498, assigned by its designer, Michael Watter of Philadelphia, to the Budd Company. The rear third of the fuselage cants upward to permit the approach of trucks. A trap-door-like ramp lets down to the rear, to permit them to drive up and in, if desired. When the plane is used in war, the ramp can be opened a crack in flight, functioning then as platform for one or more tail guns.

Science News Letter, August 23, 1947

HYDROPONICS

Food From Soilless Gardens

The Army's soilless farms are yielding millions of pounds of vegetables for the American occupation forces in Japan. Other hydroponic installations have been made.

► **SOILLESS** gardening is producing tomatoes, lettuce and other fresh things to eat by millions of pounds for American garrisons and occupation forces in Japan and other far islands. An Army Quartermaster Corps survey shows that the expected green-vegetable crops from all hydroponics installations will amount to more than 3,582,000 pounds. Nowhere else has this type of gardening ever been undertaken on such a scale.

Biggest installation is in Japan, where there is a 55-acre soilless "farm" at Chofu, near Tokyo, and another of 25 acres at Otsu, near Kyoto. Five acres of the Chofu installations are under glass—and that's major greenhouse operation in any man's gardening. These big projects are under the command of Lt. Col. E. W. Elliott, who had had previous experience in directing soilless gardening at the now abandoned pioneer establishment on Ascension island and at Atkinson Field in British Guiana. Other hydroponic installations now operating are on Iwo Jima and near Nanking, China.

First on Ascension Island

Soilless gardening was resorted to originally in such places as Ascension and Iwo because American soldiers like fresh salad vegetables and there wasn't any soil in which to grow them. It is being conducted in Japan and China because the unsanitary fertilization practices of Oriental agriculture make it unsafe to eat anything raw. All these places are so far from American ports that it is impracticable to transport fresh vegetables, either by refrigerator ship or by air.

Vegetables raised in all these soilless gardens have been reduced to a standard set of six: tomatoes, lettuce, radishes, cucumbers, onions and green peppers. The Japanese gardens are expected to produce 2,000,000 pounds of tomatoes alone. For production in the tropics, a very lucky stroke was the creation by plant breeders in the U. S. Department of Agriculture of a variety named "Slobolt", which will not go to seed when the weather is hot, as most kinds of lettuce do.

The type of soilless gardening or hydroponics adopted by the Army is known as gravel culture. Very long, shallow troughs of concrete or asphalt are filled with fine washed gravel, volcanic cinder or other inert material. Plants with their roots supported in this are watered at regular intervals with a solution containing fertilizer salts in a balanced formula. Solution running out at the lower end of a series of such troughs is caught in a sump, analyzed to determine what salts it has lost, and brought back up to standard for re-use at the next watering.

Production of vegetables by this method is admittedly not cheap. Cost accounting shows that some items, like lettuce and radishes, cost about twice the ordinary commercial production figures. On the other hand, hydroponic tomatoes cost only three cents more than commercial tomatoes: 19 cents as against 16. And cucumbers actually cost much less: four cents a pound as against 11 cents for commercially raised "cukes". Cost was highest on the pioneer establishment at Ascension island, which is strictly a desert island. There every pint of water used in the garden, and for all other purposes, had to be distilled out of sea water, with imported oil as fuel.

Costs in Japan are kept down, partly because there is plenty of natural water, but mainly because of the very high quality of Japanese help. High-ranking horticultural scientists eagerly assist Col. Elliott, and many of his "field hands" are graduate students from the universities who want to gain the "know-how" of this new American technique.

Science News Letter, August 23, 1947

AERONAUTICS

Inland Ports Planned To Promote Water Flying

► **INLAND PORTS** for flying boats, definitely included in a program of the U. S. Civil Aeronautics Administration, will extend water-flying across the continent. Lakes, rivers and flood-control and irrigation reservoirs will have a new use.

Approximately 250 major seaplane

bases throughout the United States are planned. The scheme is to have at least one such facility available to cross-country flying-boat pilots every 125 miles. In addition there are thousands of lakes that can be used for private flying.

The program is aimed at eliminating the biggest present stumbling block to the growth of seaplane flying, the Aviation Writers Association was told by Theodore M. Wayave of the CAA. Now, except for certain highly-developed regions of the country such as the Atlantic coast, seaplane pilots have few places to go where they can obtain adequate service, he stated.

The Federal Airport Act provides federal assistance in developing seaplane bases, and calls for 50-50 sharing of costs by the Federal government and local sponsors. Proper anchorage, docks for unloading, and facilities for re-fueling and servicing planes are necessities at the proposed flying-boat ports. Approach lights, and a traffic control system, would be needed at those with heavy use. The ports would require an average of \$10,000 to develop, Mr. Wayave estimates. Surveys are now underway.

Science News Letter, August 23, 1947



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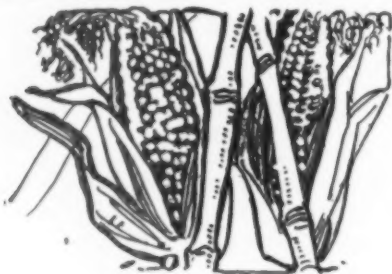


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Hybrid Vigor Helps

► CORN has been taking a terrible beating this summer. First, a late, chilly, wet spring delayed planting, in places two or three weeks past normal time. Then more rain produced disastrous floods that drowned out millions of acres of rich bottom-land fields and slowed down growth on the uplands. Finally, after the surviving crop had used up the water left in the soil by the early-summer deluges, a month or more of pitiless drought and heat took further toll. Possibility of early frosts, to add to this Job's calendar of woes, remains for us to worry about.

Nevertheless, it could have been worse. If Midwestern farmers had not been converted to the gospel of hybrid corn two decades and more ago, corn would not be standing up against its multiplied woes nearly as well as it is, and the yield from existing acreage would probably be from a fourth to a third less than can now be expected.

When Henry Wallace founded the first commercial hybrid seed-corn com-

pany, back in the early 1920's, he estimated that the then novel type of corn would produce a 10% higher yield per acre than the best open-pollinated corn then under cultivation. It appears that he was much too conservative; present-day agriculturists estimate the increase at 20% or better. This is based on growth under equivalent conditions in good seasons.

Furthermore, hybrid corn is commonly credited with being better able to withstand adverse growing conditions than the older type. It has greater over-all vigor, with stouter stalks and more prop-roots, enabling it to stay right side up under winds and rains that would cause weaker stalks to lean over and "lodge." Also, many strains of hybrid

corn are claimed to have superior drought resistance. Both these abilities to withstand unfavorable weather have been needed this year by all corn that survived early rains only to encounter drought.

Finally, if early frosts do catch much of the crop with its kernels still too moist, or "soft," for cribbing, at least some farmers may resort to the old practice of letting their fields stand unharvested until after the soil freezes, to give the ears more time to dry out, and then go in and pick the crop by hand. Here again the sheer mechanical ability of the stout, well-propped hybrid stalks to stand up against autumn winds will stand the corn in good stead.

Science News Letter, August 23, 1947

AERONAUTICS

Jet Propulsion Progress

► PROGRESS in jet propulsion of aircraft is marked by three new planes which have now passed successful flight tests and are ready for large-scale production if needed. They are the six-jet Martin Army XB-48 high-speed bomber, the jet-plus-propeller Ryan Navy XFR-4 experimental interceptor fighter, and the Douglas Navy Skystreak, which is a research plane to explore speed-of-sound traveling.

The Martin XB-48 is the largest multi-jet bomber of conventional design ever built for the Army Air Forces and is the first six-jet plane ever completed. It has a speed of over 480 miles an hour and can carry a bomb load of more than ten tons. Its six General Electric jet engines produce 24,000 pounds of thrust.

The dimensions of this new plane are approximately 108 feet in wingspan, 86 feet in length and 27 feet in height. The wings are very thin to meet requirements for flying at high speeds. There are three engines in the under surfaces of each wing, placed a short distance away from the fuselage. Landing wheels are in tandem under the fuselage itself, because the thin wings would not provide housing for them.

The new Ryan plane is much like the company's production model FR-1 Fireball in general appearances but has vastly improved performance, particularly in climbing ability. In speed, it is in the 500-mile-per-hour class. Increased speed and climbing ability are obtained by the installation of the Westinghouse 24-C axial flow jet engine in the aft section. This is more powerful than the jet engine in the earlier ver-

sions. The front engine, that drives the conventional propellers, is the same, a Wright Cyclone.

The Douglas Skystreak was designed to surpass the speed of any existing plane, and perhaps to beat the speed of sound, 761 miles an hour at sea level. It is powered with the General Electric TG-180 turbo-jet engine, similar to the powerplant in the Army Republic XP-84 which made an unofficial record of 619 miles an hour. In flight tests already made, the Skystreak showed itself to be maneuverable, stable and capable of great speed. Tests to approach the speed of sound have not yet been made. The plane, with wings of aluminum alloy and body of magnesium alloy, is claimed to be 60% stronger than any existing production aircraft.

Science News Letter, August 23, 1947

CHEMISTRY

International Chemistry Congress to Meet in U. S.

► THE TWELFTH International Congress of Pure and Applied Chemistry will be held in the United States in 1951, it was announced at the close of the eleventh Congress in London, first to be held since the war.

Dr. W. Albert Noyes, Jr., president of the American Chemical Society, said the 1951 meeting would probably be held in New York City.

Science News Letter, August 23, 1947

The *Great Lakes* have a total shore line of over 8,000 miles.

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Books of the Week

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ATOMIC ARTILLERY—James Stokley—*Gen. Elec. Res. Lab.*, 11 p., illus., paper, free. "Who's Who" among the family of atom-smashers; a recapitulation of information concerning the cyclotron, synchrotron, betatron, synchrocyclotron, electrostatic generator, linear accelerator, etc.

ELEMENTARY MEDICAL PHYSICS—Howard O. Sterns—*Macmillan*, 354 p., illus., \$4.75. As well as containing the necessary fundamentals of physics, this text for nurses and pre-medical students points out the application of the laws of physics to the biological sciences and the operation and equipment of a hospital.

FISHERY RESOURCES OF THE UNITED STATES—Lionel A. Walford—*Public Affairs Press*, 134 p., illus., \$5. Up-to-date information concerning the aquatic resources of the United States for conservationist and sportsman; includes tabulations of fish found in different regions and localities.

INDEX TO ASTM STANDARDS 1946—*Am. Soc. for Testing Mat.*, 219 p., paper, free. An adjunct to the Book of Standards to enable the standard specifications and

tests to be readily located.

NATURALISTS' DIRECTORY—*Cassino Press*, 34th ed., 204 p., paper, \$3. Names, addresses and special subjects of study of professional and amateur naturalists of North and South America, a list of periodicals dealing with natural history and a list of museums.

PROBLEMS AND PROGRESS OF FORESTRY IN THE UNITED STATES—*Society of Am. Foresters*, 110 p., \$1.75. A report of the Joint Committee on Forestry of the National Research Council and the Society of American Foresters.

PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL STRESS ANALYSIS—C. Lipson and W. M. Murray, eds.—*Addison-Wesley*, Vol. IV, No. II, 121 p., illus., \$6.

UNITED STATES NATIONAL COMMISSION FOR UNESCO: Report on Mountain-Plains Regional Conference of UNESCO, Denver, Colo., May 1947—*U. S. Natl. Comm. for UNESCO*, 39 p., paper, free. Essential features of the Conference, particularly a specific program of action agreed upon by its members.

Science News Letter, August 23, 1947

AGRICULTURE

Silos May Save Soft Corn

Artificial drying is being contemplated to help save immature corn stopped by the frost. Soft corn is economical feed for beef cattle.

► **CORN STOPPED** by frost in soft or immature condition can be salvaged by being put into silos, farm researchers point out. Soft ear-corn silage, tried out at the Iowa State Agricultural Experiment Station, was proved to be an economical feed for beef cattle, almost equalling normal shelled corn in value per acre, though not as valuable as regular corn silage.

In the experiments, steers were fed on the soft-corn silage as their main ration for 113 days. This was followed by a finishing period of 30 days on shelled corn and regular silage.

Department of Agriculture scientists, however, are not depending on silos to save the whole of the 200,000,000 bushels threatened with being left in soft condition by early frosts. Artificial drying of corn, hitherto not considered necessary on a large scale at least, is seriously contemplated for the first time in American farm history. A conference of federal and state agricultural engineers has

just been held at Purdue University, to bring the best existing "know-how" to bear on the problem.

There are some corn-driers in operation now, but they are for the most part large-scale, stationary machines used only in grain elevators. They will not solve the problem for farmers who wish to store their corn on their own premises. What is needed are mobile corn driers that can be tractor-hauled from farm to farm, or small-scale driers not too costly for individual farmers to own and operate.

A few machines of this type have been patented, and some of them built; but how many of them are ready for operation, or can be put into operation by first frost this year, is still uncertain. It is not even certain whether a machine built for use in one state, say Nebraska, would be useful in a state where moisture conditions are different, like Illinois or Indiana. The wetter corn in those states, subjected to too severe drying conditions, might be spoiled in the process.

Individual farmers with mechanical genius may be able to meet their own drying problems, especially if their farms are electrified. It may be possible to adapt the hay-driers already installed in many barns to the task of drying corn, or ducts with blowers may be arranged in existing corn-cribs.

Finally, earlier practices may be resorted to, like letting the corn stand in the field until it dries and then hand-picking it after the ground is frozen, or stacking it in shocks until the ears dry. These methods are less economic than modern machine harvesting, but they can serve in a pinch. And the pinch is likely to come this fall.

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CHEMISTRY

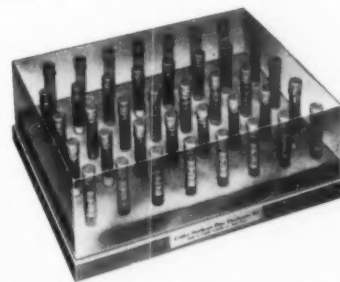
Fabrics from Peanuts

► **PEANUTS** join the procession of protein sources used for the production of synthetic fibers and fabrics, in patent 2,424,408, issued to Sarah N. McGeoch of Greenford, England, and assigned by her to Imperial Chemical Industries, Ltd. The peanut globulin is extracted with strong alkali at moderately low temperature.

Science News Letter, August 23, 1947

Scientific Odor Control

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✿ **FIVE-IN-ONE TOOL** is primarily a screwdriver and a double-headed hammer. It has a crossarm, with balanced hammer heads on its ends, that slides along the screwdriver shank. When the crossarm is near the plastic handle, it helps to spin the tool; when near the blade, the tool becomes a tack hammer.

Science News Letter, August 23, 1947

✿ **BABY ANCHOR** holds a sitting infant safely in the bathtub. It consists of a three-legged device with rubber suction feet that holds an aluminum backrest against the youngster. A strap around the child and backrest hold him in place.

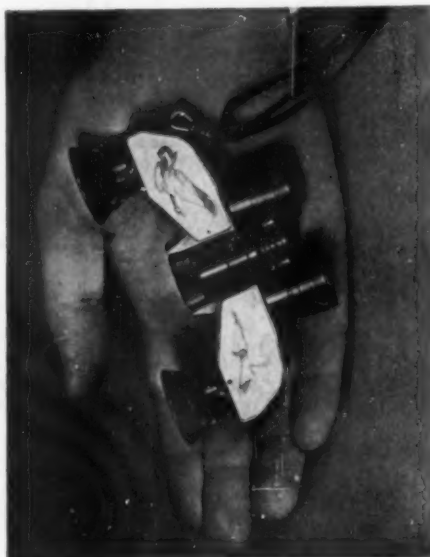
Science News Letter, August 23, 1947

✿ **"QUIETORIUM"** is a soundproof room for sound-testing household refrigerator compressors. It has soundproof walls, and is mounted on 50 steel coil springs set in a bed of cinders that keeps out earth vibrations. Within it, the human ear detects machinery operating sounds.

Science News Letter, August 23, 1947

✿ **LIQUID LOCKER**, for holding loosened rungs in chairs, loose handles on tools and many similar applications, enters the wood itself and causes expansion which does the holding. It is not an adhesive; it merely expands the wood fibers. It can be used to swell the wood in an enlarged screw hole.

Science News Letter, August 23, 1947



✿ **HIGH-POWER BINOCULAR**, for sportsmen and travelers, weighs about four ounces and is small enough to fit in the hand as shown in the picture. Its body is magnesium, and within is a Leman prism, a single piece of optical glass said to transmit more light than other two-prism systems.

Science News Letter, August 23, 1947

✿ **PRISMATIC street lamp** puts 40% more light on the roadway than earlier types, it is claimed. Because of the many prisms which comprise the glass globe,

the light is directed in two broad beams up and down the street.

Science News Letter, August 23, 1947

✿ **RADIO-TELEPHONE** for owners of small boats is portable, and has within the unit a battery that can be recharged at home with the usual house electric current. Having its own electric power, it can be used on craft without other electrical equipment.

Science News Letter, August 23, 1947

✿ **KITCHEN DISHTOWEL**, 20% asbestos and 80% cotton, wipes dishes faster and drier because asbestos has ability to absorb considerable quantities of water rapidly. Also the asbestos, which is a mineral, imparts a polish to china and glass.

Science News Letter, August 23, 1947

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